English

Gig-E Multiplexer

CL-GE300

Product Specification & Operation Manual

CIS Corporation

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1. Scope of Application

This is to describe CL-GE300 Gig-E Multiplexer. All specifications contained herein are subject to change without prior notice. Reproduction in whole or in part is prohibited.

2. Handling Precautions

The camera must not be used for any nuclear equipments or aerospace equipments with which mechanical failure or malfunction could result in serious bodily injury or loss of human life. Our warranty does not apply to damages or defects caused by irregular and/or abnormal use of the product.

Please observe all warnings and cautions stated below.

Our warranty does not apply to damages or malfunctions caused by neglecting these precautions.

- Please refer to Chapter 7, "Recommended Cameras" for the cameras which should be used with CL-GE300. Cameras other than those specified in Chapter 7 should be out of warranty.

- Do not use or store the camera in the following extreme conditions:
  - Extremely dusty or humid places.
  - Extremely hot or cold places (operating temperature –5℃ to +45℃)

- Do not apply excessive force or static electricity that could damage the Gig-E Multiplexer.

- Follow the instructions in Chapter 6, "External connector pin assignment" for connecting. Improper connection may cause damages not only to the multiplexer but also to the connected devices.

- Camera link connector input shall be PoCL (Power Over Camera Link) applied. PoCL cameras and PoCL cables should be used with the CL-GE300 multiplexer. Wrong combination usage may cause damages or destroy the multiplexer and cameras.

- Confirm the mutual ground potential carefully and then connect the multiplexer to monitors or computers. AC leaks from the connected devices may cause damages or destroy the multiplexer.

- Do not apply excessive voltage. (Use only the specified voltage.) Unstable or improper power supply voltage may cause damages or malfunction of the camera or the multiplexer.

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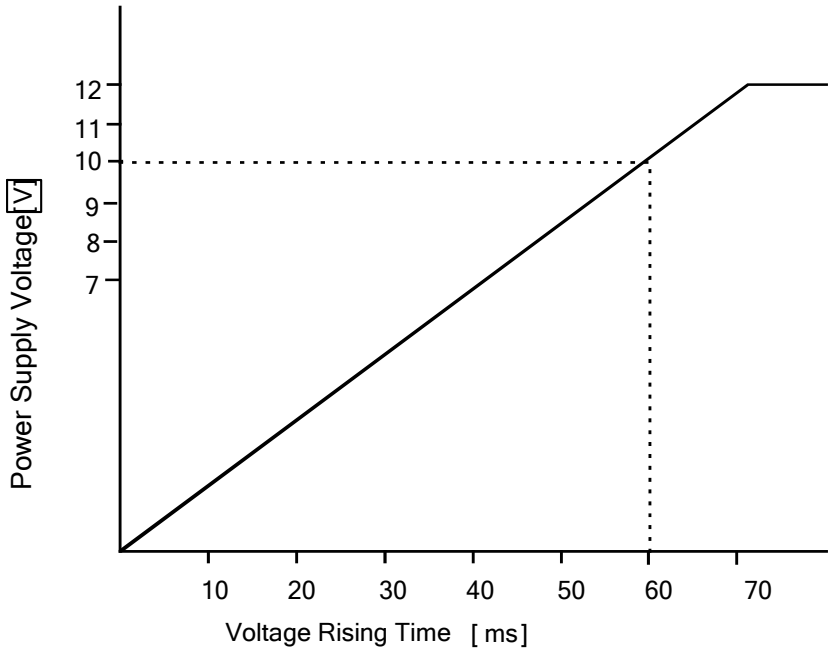
- The voltage ripple of camera power DC +12V±10% shall be within ±50mV. Improper power supply voltage may cause noises on the video signals.

- The rising time of camera power supply voltage shall be less than +10V, Max 60ms. Please avoid noises like chattering when rising.



In case of abnormal operation, contact the distributor from whom you purchased the product.

3. Product Outline

CL-GE300 is a multiplexer module, which converts camera link input into Gigabit Ethernet output. With synchronizing cameras, up to 3 cameras can be connected to CL-GE300. (Cameras shall be the same resolution.) **PoCL cameras and PoCL camera link cables must be used.**

Key Features

☐ 100MB/s image data can be transmitted at blazing speed via Ethernet.
☐ Image data can be remote transferred 100m at category 5e level.
☐ Maximum 3 same resolution cameras can be connected to CL-GE300 with synchronizing them.
☐ Minimize system architecture adapting PoCL. (Power over Camera Link.)
☐ iPORT SDK 2.2.2.0 build 113 (SP3) can be downloaded from our home page.

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4. Specifications

4.1. General Specifications

(1) Video Input	PoCL(Power Over Camera Link)	Base Configuration x 3 units (max.)	
(2) Video Output	RJ-45 Gigabit Ethernet	10Base /100Base /1000Base	
	Host Ethernet Card (Recommended)	Intel 82540 series Lan Chip Mounted Card	
	PC Recommended	・Intel Pentium 4 over 1.4GHz or AMD Arthron ・Host Memory: over 128 MB (512 MB Recommended) ・General AGP Graphics Card	
(3) External Connector Interface	12 pin Circular Connector (HIROSE: HR10A-10R-12PA(73)	・Input Power (DC +12V) ・Trigger Input (LV TTL) x 3 ・RS 232C x 1	
(4) Pixel Format	(1) B/W	8bit / 10bit / 14bit / 16bit 8bit / 10bit	(CL IN1 input) (CL IN2/CL IN3 input)
	(2) Color (RAW)	8bit / 10bit / 14bit / 16bit 8bit / 10bit	(CL IN1 input) (CL IN2/CL IN3 input)
	(3) Color (RGB) Pixel Clock	24bit RGB Max85MHz	(CL IN1 input only)
(5) Engineering Kit	Development Kit	・C++, VB SDK(Windows2000 & XP)	
	Accessory GUI	・Launch Coyote Application (Capturing and indicating the image) ・CIS_Sample Program (Capturing and indicating the images from 3 cameras)	
	Image Processing Software	・CommonVision,eVision,Halcon,ImagePro ・LavVIEW,MIL,Spera etc.	
(6) Power requirements	DC+12V±10% (Max voltage not to exceed 15V)		
(7) Power consumption	CL-GE300 3.5W		
	Referenced data of power consumption when CL-GE 300 is connected to VCC-G22U21PCL	One camera	6.0W
		Two cameras	9.0W
		Three cameras	12.0W
(8) Dimension	Refer to overall dimension drawing (Clause 11) 37mm(H) x 62mm(W) x 90mm(D) (excluding protruding portion)		
(9) Mass	Approx. 270g		
(10) Safety/Quality Standards	・RoHS ・FCC Class A Digital Device This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.		

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(11) Durability	Vibration resistance	Acceleration	: 98m/s^2 (10G)
		Vibration frequency	: 20～200 Hz
		Direction	: X,Y,Z 3directions
		Testing time	: 120 min for each direction
	Shock resistance	Acceleration	: 490m／s^2 (50G)
		Directions	: ±X, ±Y, and ±Z 6 directions
		*Without package	
(12) Operation Environment	Temperature	Performance guaranteed temperature: 0℃～+40℃ Camera operation guaranteed temperature: -5℃～+45℃ ※ All the specifications specified in this manual is guaranteed under performance guaranteed temperature. ※All the camera functions operate normally under operation guaranteed temperature	
	Humidity	RH 20～80% with no condensation	
(13) Storage Environment	Temperature	-25℃ ～ +60℃	
	Humidity	RH 20～80% with no condensation	

5. Function Settings

Function	Address	Data
Internal Trigger Cycle	000	0 : OFF 1 – 255 : 888μs + (444μs x n)
Trigger Input Selection	001	0 : CL1 IN – Trigger IN 0, CL2 IN – Trigger IN 1, CL3 IN – Trigger IN 2 1 : CL1 IN , CL2 IN , CL3 IN – Trigger IN 0 2 : CL1 IN , CL2 IN , CL3 IN – Internal Trigger Generated in the CL-GE300 (Cycle : Address 000) 3 :CL1 IN , CL2 IN , CL3 IN – Software Trigger
10bit / 8bit Selection	002	0 : 8bit 1 :10bit ※ Valid only at MONO (RAW) setting.
RGB/MONO(RAW) Selection	003	0 : MONO(RAW) 1 : RGB
Output Channel Selection	004	0 : CL1 IN OUT 1 : CL2 IN OUT 2 : CL3 IN OUT 3 : CL1 IN , CL2 IN , CL3 IN Synchronized OUT 4 : RGB OUT 5 – 7 : CL1 IN OUT

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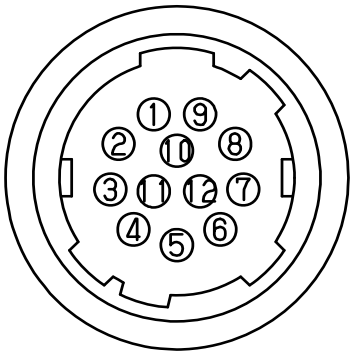
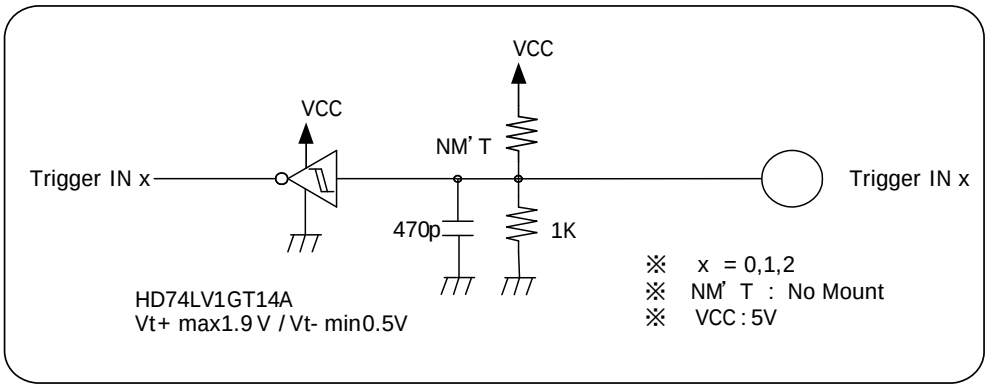
6. External Connector Interface

6.1. 12pins Circular Connector HR10-10R-12PA (73) (HIROSE)

Pin No.	
1	GND
2	Power IN DC+12V
3	GND
4	NC
5	GND
6	RS232C RxD
7	RS232C TxD
8	GND
9	Trigger IN 2
10	Trigger IN 1
11	Trigger IN 0
12	GND





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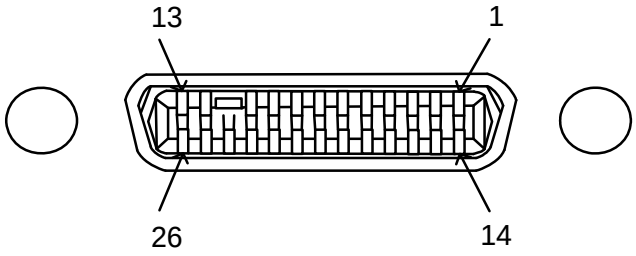
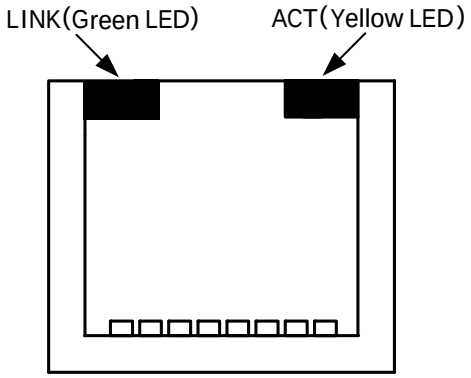
6.2. 26pins Mini Camera Link Connector 12226-5100-00PL (SUMITOMO 3M)



Pin No.		Pin No.	
1	DC+12V OUT	14	GND
2	X0-	15	X0+
3	X1-	16	X1+
4	X2-	17	X2+
5	Xclk-	18	Xclk+
6	X3-	19	X3+
7	SerTC+	20	SerTC-
8	SerTFC-	21	SerTFC+
9	CC1- (Trigger OUT-)	22	CC1+ (Trigger OUT+)
10	CC2+	23	CC2-
11	CC3-	24	CC3+
12	CC4+	25	CC4-
13	GND	26	DC+12V OUT

6.3. RJ-45 Gigabit Ethernet Connector XRJV-S-01-8-8 (XMULTIPLE)



LINK LED : Unlighted ・・・ Not connected to LAN.
Lighting ・・・ Connected to LAN.
Blinking ・・・ Transmitting data.

ACT LED : Unlighted ・・・ Unconnected or connected at 10Mbps/100Mbps.
Lighting ・・・ Connected at 1000Mbps.

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7. Recommended Cameras

CIS B/W cameras

	CLK 24.545MHz Series	CLK 49.090MHz Series	CLK 72MHz Series
	29mm × 29mm × 29mm	29mm × 29mm × 29mm	44mm × 29mm × 71.5mm
VGA (1/3")	VCC-G21V31PCL 60fps	VCC-G22V31PCL 120fps	
SXGA (1/2")		VCC-G22S21PCL 25fps	VCC-G32S21PCL 38fps
SXGA (2/3")			VCC-G32S11PCL 34fps
UXGA (1/1.8)"		VCC-G22U21PCL 20fps	VCC-G32U21PCL 30fps

CIS Color cameras

	CLK 24.545MHz Series	CLK 49.090MHz Series	CLK 72MHz Series
	29mm × 29mm × 29mm	29mm × 29mm × 29mm	44mm × 29mm × 71.5mm
VGA (1/3")	VCC-F21V39PCL 60fps(RAW)	VCC-F22V39PCL 120fps(RAW)	
SXGA (1/2")		VCC-F22S29PCL 25fps(RAW)	VCC-F32S29PCL 38fps(RAW&RGB)
SXGA (2/3")			VCC-F32S19PCL 34fps(RAW&RGB)
UXGA (1/1.8)"		VCC-F22U29PCL 20fps(RAW)	VCC-F32U29PCL 30fps(RAW&RGB)

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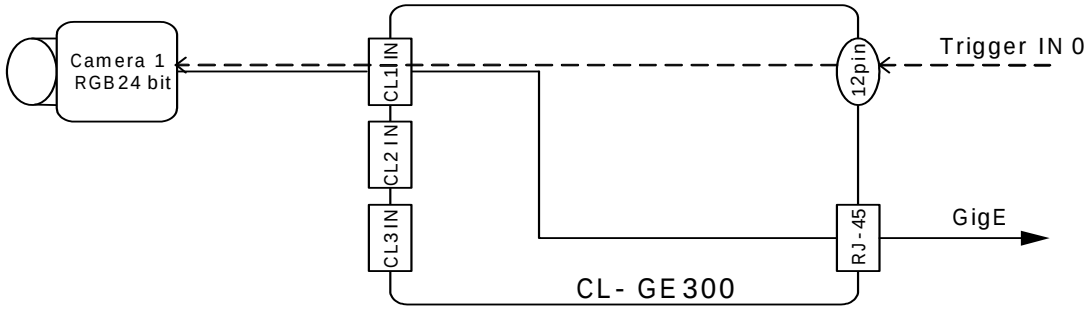
8. CL-GE300 Connection Diagram

8.1. Example 1: Using 1 camera



(Camera side: RGB 24bit output, Trigger Input: Trigger IN 0 input)

Recommended cameras : VCC-G21PCL series, VCC-G22/F22PCL series, VCC-G32/F32PCL series
Conditions : Connect the camera to CL1 IN when using RGB 24 bit output cameras.

Camera settings

	Address	Data	Remarks
Camera side			Set the camera to trigger mode. (Refer to the Specifications, address settings for the details.)
CL-GE300 side	001	000	CL1 IN—Trigger IN 0
	003	001	RGB
	004	004	RGB 24bit output

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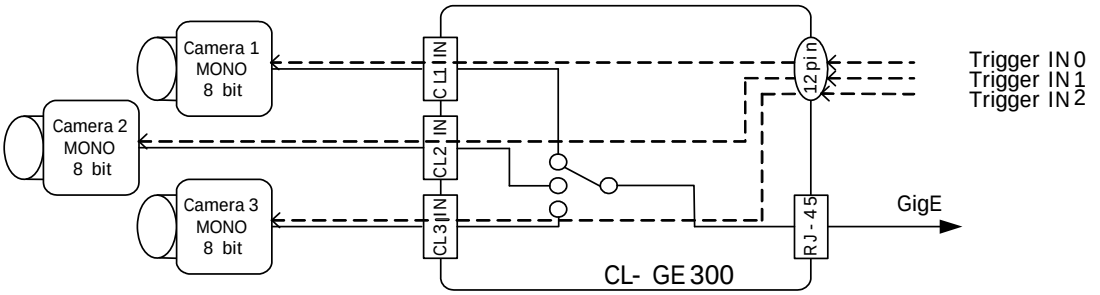
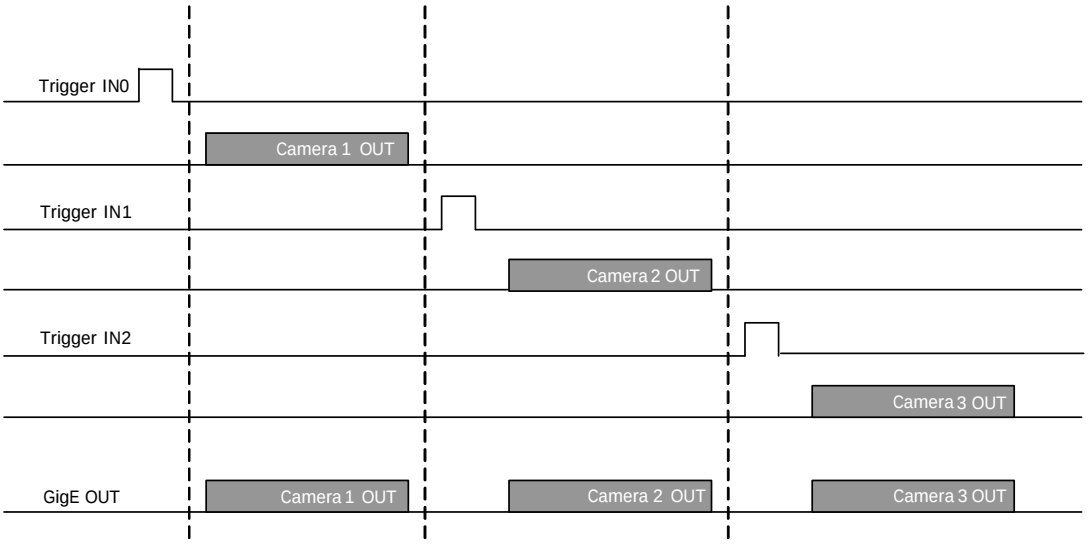
8.2. Example 2: Multiple Cameras/Switching Cameras





(Camera side: MONO 8bit output, Trigger input: Trigger IN 0, IN 1, IN 2 input)

Recommended cameras : VCC-G21PCL series, VCC-G22/F22PCL series, VCC-G32/F32PCL(RAW mode) series

Conditions :
- Select RAW output cameras when using color cameras. RGB output cameras shall not be connected.
- Cameras with same pixels and same frame rate shall be selected.
- Signal output will be switched as soon as CL-GE300 receives the command to switch (address 004). (Output channel will be switched even when the images are in the middle of outputting.)

Camera settings

	Address	Data	Remarks
Camera side			Set the camera to trigger mode. (Refer to the Specifications, address settings for the details.)
CL-GE300 side	001	000	CL1 IN—Trigger IN 0, CL2 IN—Trigger IN 1, CL3 IN—Trigger IN 2
	002	000	8bit
	003	000	MONO
	004	000～002	Output channel switching

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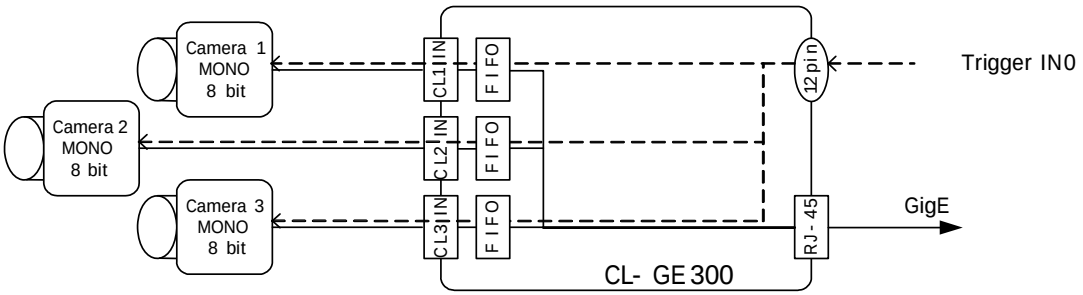
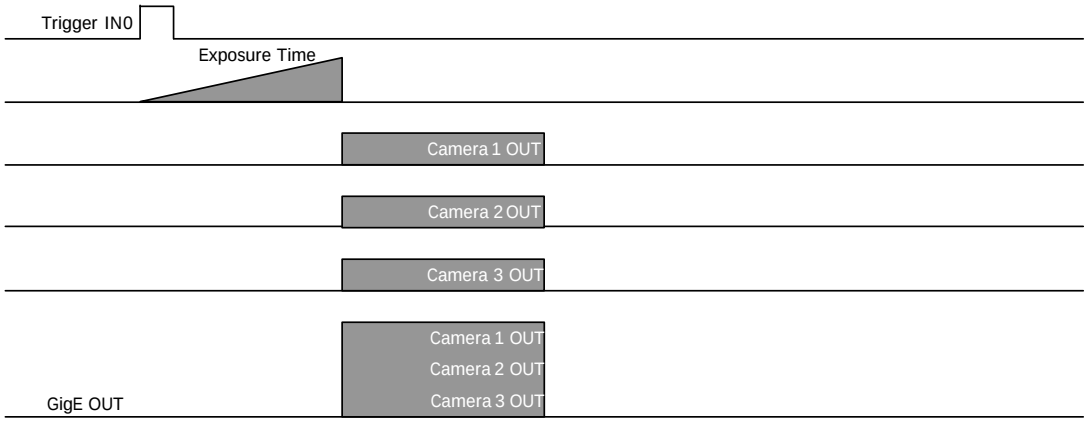
8.3. Example 3: Multiple Cameras/Synchronizing Cameras





(Camera side: MONO 8bit output, Trigger input: Trigger IN 0 input)

Recommended cameras : VCC-G22/F22PCL series, VCC-G32/F32PCL (RAW mode) series

Conditions :
- Select RAW output cameras when using color cameras. RGB output cameras shall not be connected.
- Cameras with same pixels and same frame rate shall be selected.
- Different triggers cannot be input. Also, different shutter values cannot be set either.

Camera settings

	Address	Data	Remarks
Camera side			Set the camera to trigger mode. (Refer to the Specifications, address settings for the details.) When using VCC-G22/F22 PCL series, set the cameras t o HV-SYNC reset mode.
CL-GE300 side	001	001	CL1 IN, CL2 IN, CL3 IN—Trigger IN 0
	002	000	8bit
	003	000	MONO
	004	003	CL1 IN, CL2 IN, CL3 IN Synchronized OUT

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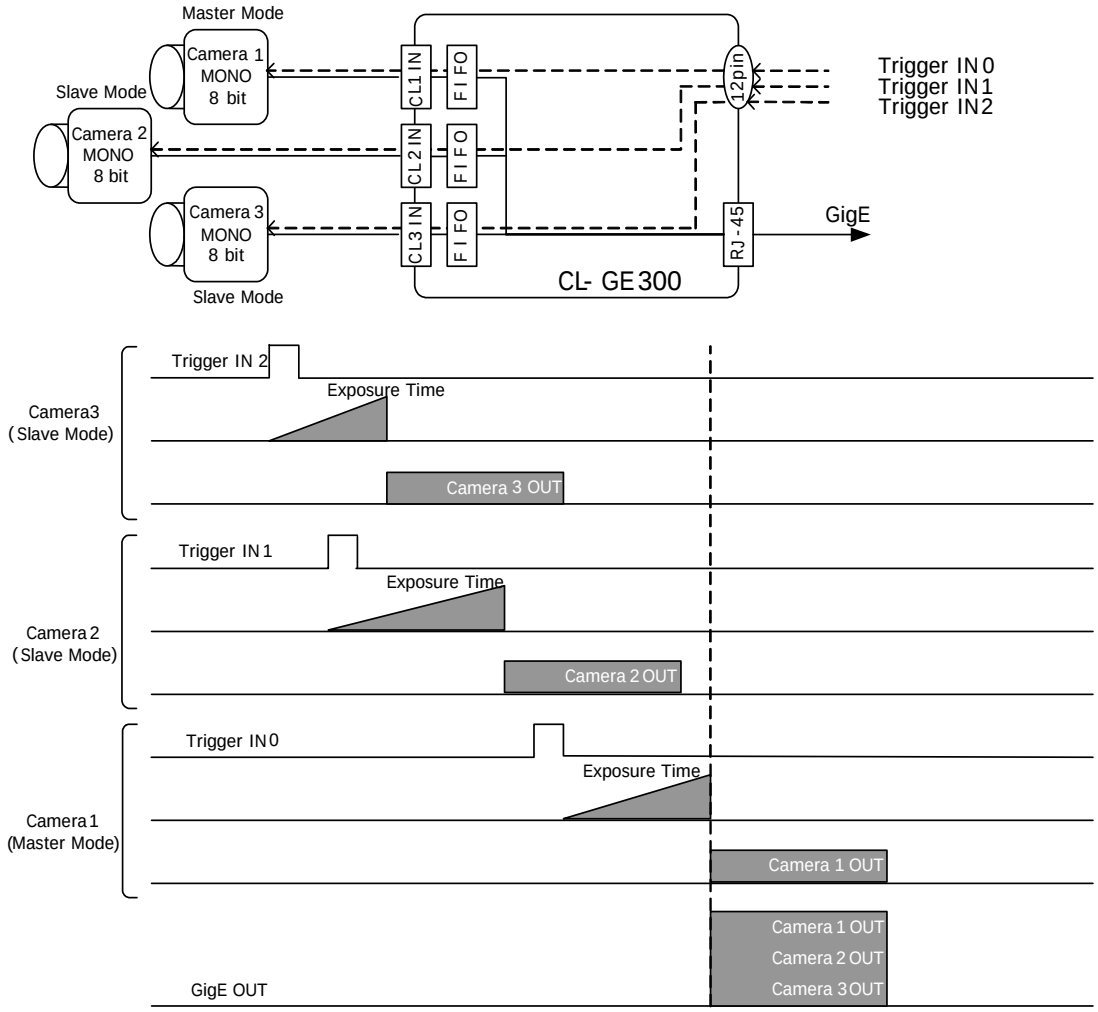
8.4. Example 4: Multiple Cameras/Different Triggers and Different Shutter Values



(Camera side: MONO 8bit output, Trigger Input: Trigger IN 0, IN 1, IN 2 input)

Recommended cameras : VCC-G32/F32PCL(RAW mode) series

Conditions :
- Select RAW output cameras when using color cameras. RGB output cameras shall not be connected.
- Cameras with same pixels and same frame rate shall be selected.
- Connect the master camera to CL1 IN. Slave cameras' output is output synchronizing with the master camera CCD output. Exposure of the slave cameras shall be completed before the completion of the master camera's exposure.

Camera Settings

	Address	Data	Remarks
Camera side			Set the camera to trigger mode. (Refer to the Specifications, address settings for the details.)
CL-GE300 side	001	000	CL1 IN—Trigger IN 0, CL2 IN—Trigger IN 1, CL3 IN—Trigger IN 2
	002	000	8bit
	003	000	MONO
	004	003	CL1 IN, CL2 IN, CL3 IN Synchronized OUT

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9. Function Settings

With serial communications via LAN or 12pins circular connector RS-232C port, both cameras and CL-GE 300 functions can be set.

(1) Serial communication settings are as follows.

Baud rate : 9600bps
Data : 8bit
Stop bit : 1bit
Parity : None
XON/XOFF : not controlled

(2) Control code

- The total control code is 14 bits, which conforms to ASCII code.
- The control code consists of camera No. process code, remote controller address, remote controller data, and CR. Execute Read/Write through PC, and the camera will reply the data.

<table>
<tr><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7th Byte</th><th>8</th><th>9</th><th>10</th><th>11</th><th>12</th><th>13</th><th>14</th></tr>
<tr><td colspan="6">Camera No.</td><td>Process code</td><td colspan="3">Remote controller address</td><td colspan="3">Remote controller data</td><td>CR</td></tr>
<tr><td colspan="6">000000 : to CL1 IN
100000 : to CL2 IN
200000 : to CL3 IN
300000 : to all (CL1 IN/2 IN/3 IN)
400000 : to CL-GE300</td><td>“R” Read mode
“W” Write mode
“C” Camera mode</td><td colspan="3">Please refer to the address table, in Section 5.</td><td colspan="3">000～255</td><td>0Dh</td></tr>
</table>

10. Initial Settings

Functions	Address	Data
Internal Trigger Cycle	000	0:OFF
Trigger Input Selection	001	0:CL1 IN-Trigger IN 0,CL2 IN-Trigger IN 1,CL3 IN-Trigger IN 2
10bit/8bit Selection	002	0:8bit
RGB/MONO(RAW) Selection	003	0:MONO(RAW)
Output Channel Selection	004	0:CL1 IN OUT

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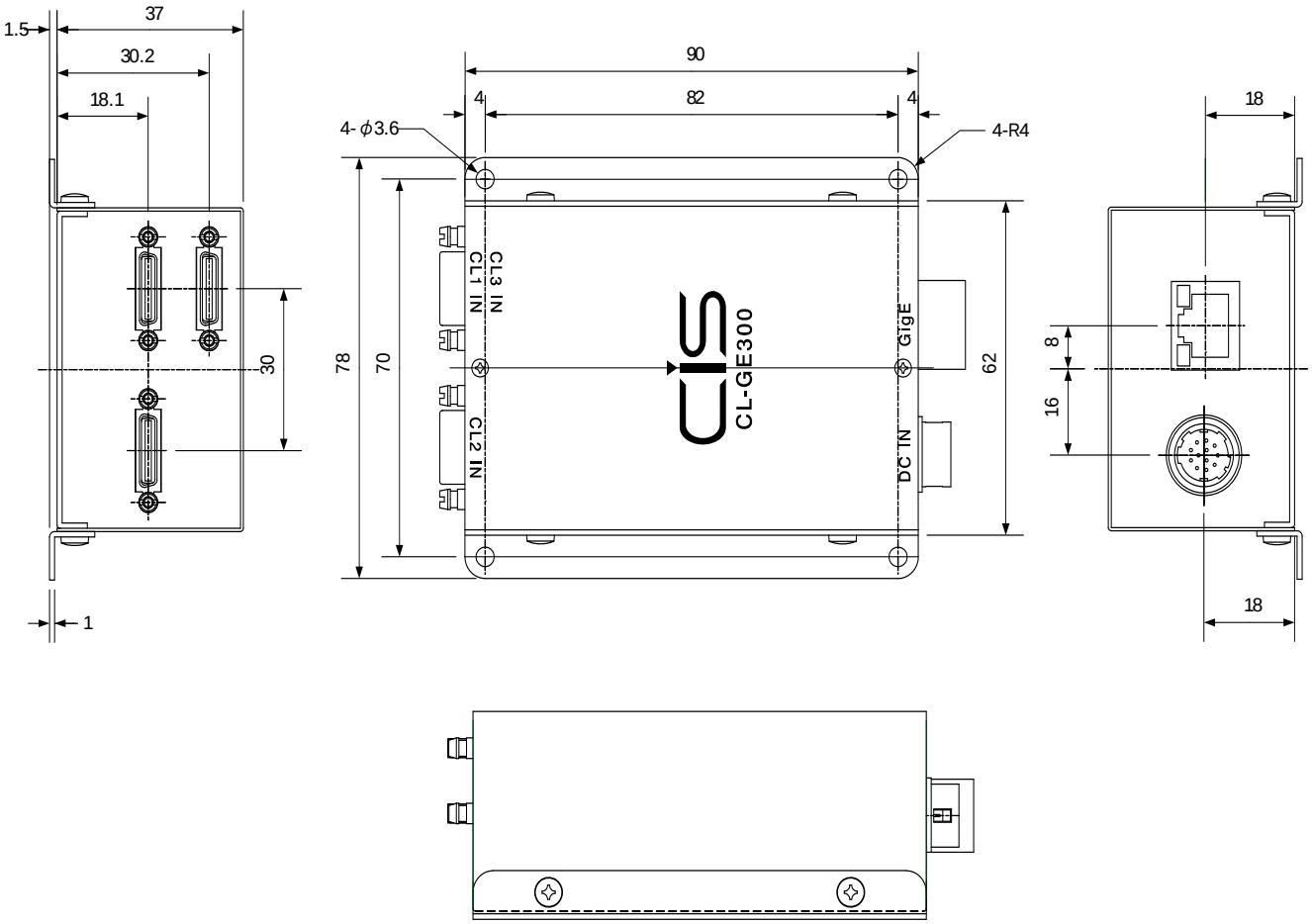
11. Dimensions



999-432-00-00
(Unit: mm)

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12. Cases for Indemnity (Limited Warranty)

We shall be exempted from taking responsibility and held harmless for damage or losses incurred by the user in the following cases.

- In case damage or losses are caused by fire, earthquake, or other acts of God, acts by third party, deliberate or accidental misuse by the user, or use under extreme operating conditions.
- In case indirect, additional, consequential damages (loss of business interests, suspension of business activities) are incurred as result of malfunction or non-function of the equipment, we shall be exempted from responsibility for such damages.
- In case damage or losses are caused by failure to observe the information contained in the instructions in this product specification & operation manual.
- In case damage or losses are caused by use contrary to the instructions in this product specification & operation manual.
- In case damage or losses are caused by malfunction or other problems resulting from use of equipment or software that is not specified.
- In case damage or losses are caused by repair or modification conducted by the customer or any unauthorized third party (such as an unauthorized service representative).
- Expenses we bear on this product shall be limited to the individual price of the product.

13. Product Service

In case of abnormal operation, contact the distributor from whom you purchased the product.

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